

Blood-Stream Infection (CDC)

From: Denise Macklin [plsystinc@msn.com]

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To: Blood-Stream Infection (CDC)

To whom it may concern: Recommendation #6 a split septum is preferred over a mechanical valve (Category II).

I am very concerned about your connector discussion. It seems that the writers are not well versed in terminology. The continued misuse of terminology is causing a great deal of confusion in the clinical setting. In 1991 needlefree connectors came into the healthcare arena. The interlink by BD was the first. This early technology used a split septum with activation by blunt cannula. The multiple pieces used made it somewhat cumbersome. The goal became luer activated. Meaning you could screw a syringe or tubing directly onto the connector. The reflux associated with disconnection led to an increase in occlusion. Late 1990's the engineering solution was luer activated positive pressure. This design moved the reflux to connection. The negative pressure was then released with disconnection. This type of connector possibly led to the term mechanical valve because it required an internal system to achieve the negative pressure on connection. While this terminology used in a specific study means something, it is inappropriate to use it outside of the study. In these studies interlink was the split septum. But today BD has a new product the Q-syte. The change is that this is a split septum that can be accessed with a luer device. This is a completely different product and has been associated with increase infection. The problem has arisen because of the attempt to not use commercial names but use general descriptions. These descriptions can not be generalized outside of the original research. However, that is what has happened and continues in this document. This leads to poor outcomes for patients. The positive pressure devices have been shown to be involved in higher CR-BSI rates. Jarvis, Rupp and others have shown this. I have personally heard first person clinical accounts during my lectures. Additionally the IDSA/SHEA Compendium stresses the strongly-supported practices of hygiene and swabbing, and suggests considerable thought and evaluation be given to positive pressure mechanical valves while steering clear of any other recommendation relative to connectors. Often the term mechanical valve is generalized to mean any connector.

In 2004 a new design entered the market place. It has zero reflux with connection or disconnection and has proven clinically to be a huge addition to any CR-BSI reduction bundle. It first was reported by Harnage and the Sutter Roseville Hospital in Sacramento continues to have zero CR-BSI now close to 4 years. With this in mind it seems to me that a clearer terminology would be focused on negative pressure (reflux with disconnection, positive pressure (reflux on connection) and zero fluid displacement (no reflux). Reflux increases fibrin sheath which is the building block of Biofilm formation. Different connectors require different care and maintenance. Institutions often use more than one type. The care and maintenance of these connectors is quite different.

Negative Pressure	Positive Pressure	Zero Fluid Displacement

Bionector®, Clave®, ClearLink®, FloStar™, InterLink®, LifeShield®, MicroClave®, Q-Syte™, SafeLine®, SmartSite®, V-Link ®	CLC2000®, Flowlink®, MaxPlus™, Posiflow™, SmartSite Plus®, UltraSite®	InVision-Plus® with Neutral Advantage™ Technology.
Disconnect Care: Flush, Keep pressure on syringe, Close the Clamp, Remove syringe from injection port.	Disconnect Care: Flush, Remove syringe from injection port, Clamp.	Disconnect Care: Flush, Clamping sequence not required. Clamp when not in use for patient safety.

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Intraluminal Fluid Pathway contamination has been identified as an important nidus for infection. Maki D. (2004). Intensive Care Med, 30:62 Garland JS et al. (2008). ICHE, 29:243 Clinically, this is probably related to the almost exclusive use of the intravenous route of administration in the acute care setting. The protector of this pathway is the connector. Nursing care is the only care that is available. This includes swabbing and flushing. These practices minimize bacterial entry into the pathway and minimize fibrin coating of the wall surface. Improper or confusing terminology poses a threat to patient care and increases confusion in the marketplace.

As you can see from my comments, connector care and maintenance is a vital area of care but it is much more device specific and that misleading terminology is only making matters worse. Notable infection control physicians have identified the positive pressure classification as related to BSI. Negative pressure connectors are related to thrombosis another indicator for BSI. The new Zero fluid displacement connector is associated with significantly lower BSI. When writing the document please investigate what device was used in the study and do not generalize that terminology. In addition, define terminology that you use. In today's complex healthcare setting, generalized connector terminology can lead to poor patient outcomes.

Thank you so much

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